



## SEQUENCE LISTING

<110> Branch, Andrea D.  
Walewski, Jose L.  
Stump, DeCherd D.

*Sub.C1* <120> NOVEL HEPATITIS C VIRUS PEPTIDES AND USES THEREOF

<130> RII-003CPUS

<140> US 09/719277

<141> 2000-04-13

<150> US 60/088670

<151> 1998-06-09

<150> US 60/089138

<151> 1998-06-11

<150> PCT/US99/12929

<151> 1999-06-09

<160> 17

<170> PatentIn Ver. 2.0

<210> 1

<211> 595

<212> DNA

<213> Hepatitis C virus

<400> 1

```
gcacgaatcc taaacctcaa agaaaaacca aacgtaaac caaccgtcgc ccacaggacg 60
tcaagtcccc ggggtggcgt cagatcggtt gtggagttaa cttgttgccg cgcaggggcc 120
ctagattggg tgtgcgcgcg acgaggaaga cttccgagcg gtcgcaacct cgaggtagac 180
gtcagcctat ccccaaggca cgtcggcccg agggcaggac ctgggctcag cccgggtacc 240
cttggccctt ctatggcaat gaggggttgc ggtgggcggg atggctcctg tctccccgtg 300
gctctcggcc tagctggggc cccacagacc cccggcgtag gtcgcgcaat ttgggtaagg 360
tcatcgatac ccttacgtgc ggcttcgcgc acctcatggg gtacataacc ctgcgcggcg 420
cccctcttgg aggcgctgcc agggccctgg cgcattggcg ccgggttctg gaagacggcg 480
tgaactatgc aacagggaac cttccttggt gctctttctc tatcttctt ctggccctgc 540
tctcttgctt gactgtgccc gcttcagcct accaagtgcg caattcctcg gggct 595
```

<210> 2

<211> 196

<212> PRT

<213> Hepatitis C virus

<400> 2

```
Ala Arg Ile Leu Asn Leu Lys Glu Lys Pro Asn Val Thr Pro Thr Val
  1             5             10             15
```

```
Ala His Arg Thr Ser Ser Ser Arg Val Ala Val Arg Ser Leu Val Glu
  20             25             30
```

```
Phe Thr Cys Cys Arg Ala Gly Ala Leu Asp Trp Val Cys Ala Arg Arg
  35             40             45
```

```
Gly Arg Leu Pro Ser Gly Arg Asn Leu Glu Val Asp Val Ser Leu Ser
  50             55             60
```

RECEIVED  
MAR 26 2003  
TECH CENTER 1600/2900

Pro Arg His Val Gly Pro Arg Ala Gly Pro Gly Leu Ser Pro Gly Thr  
 65 70 75 80  
 Leu Gly Pro Ser Met Ala Met Arg Val Ala Gly Gly Arg Asp Gly Ser  
 85 90 95  
 Cys Leu Pro Val Ala Leu Gly Leu Ala Gly Ala Pro Gln Thr Pro Gly  
 100 105 110  
 Val Gly Arg Ala Ile Trp Val Arg Ser Ser Ile Pro Leu Arg Ala Ala  
 115 120 125  
 Ser Pro Thr Ser Trp Gly Thr Tyr Arg Ser Ser Ala Pro Leu Leu Glu  
 130 135 140  
 Ala Ala Pro Gly Pro Trp Arg Met Ala Ser Gly Phe Trp Lys Thr Ala  
 145 150 155 160  
 Thr Met Gln Gln Gly Thr Phe Leu Val Ala Leu Ser Leu Ser Ser Phe  
 165 170 175  
 Trp Pro Cys Ser Leu Ala Leu Cys Pro Leu Gln Pro Thr Lys Cys Ala  
 180 185 190  
 Ile Pro Arg Gly  
 195

<210> 3  
 <211> 13  
 <212> PRT  
 <213> Hepatitis C virus

<220>  
 <221> Variant  
 <222> 8  
 <223> Xaa = Asn or Lys

<220>  
 <221> Variant  
 <222> 9  
 <223> Xaa = Val or Glu

<220>  
 <221> Variant  
 <222> 13  
 <223> Xaa = Ala or Val

<400> 3  
 Leu Asn Leu Lys Glu Lys Pro Xaa Xaa Thr Pro Thr Xaa  
 1 5 10

<210> 4  
 <211> 13  
 <212> PRT  
 <213> Hepatitis C virus

<220>  
 <221> Variant

<222> 6  
<223> Xaa = Leu or Ser

<220>  
<221> Variant  
<222> 10  
<223> Xaa = Ala or Val

<220>  
<221> Variant  
<222> 11  
<223> Xaa = Ala or Val

<400> 4  
Ala Ala His Arg Thr Xaa Ser Ser Arg Xaa Xaa Val Arg  
1 5 10

<210> 5  
<211> 14  
<212> PRT  
<213> Hepatitis C virus

<400> 5  
Leu Asn Leu Lys Glu Lys Pro Asn Val Thr Pro Thr Ala Cys  
1 5 10

<210> 6  
<211> 14  
<212> PRT  
<213> Hepatitis C virus

<400> 6  
Ala Ala His Arg Thr Ser Ser Ser Arg Ala Val Val Arg Cys  
1 5 10

<210> 7  
<211> 18  
<212> PRT  
<213> Hepatitis C virus

<400> 7  
Pro Thr Asp Pro Arg Arg Arg Ser Arg Asn Leu Gly Lys Val Ile Asp  
1 5 10 15

Thr Cys

<210> 8  
<211> 20  
<212> PRT  
<213> Hepatitis C virus

<400> 8  
Gly Cys Ala Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg  
1 5 10 15

Arg Ala Pro Ile  
20

<210> 9  
 <211> 195  
 <212> PRT  
 <213> Hepatitis C virus

<400> 9  
 Ala Gln Ile Leu Asn Leu Lys Glu Lys Pro Asn Val Thr Pro Thr Ala  
 1 5 10 15  
 Ala His Arg Thr Leu Ser Ser Arg Val Ala Val Arg Ser Leu Ala Glu  
 20 25 30  
 Phe Thr Cys Cys Arg Ala Gly Ala Pro Asp Trp Val Cys Ala Arg Leu  
 35 40 45  
 Gly Arg Leu Pro Ser Gly Arg Ser Leu Val Glu Gly Ala Ser Leu Ser  
 50 55 60  
 Pro Arg Ile Ala Gly Pro Arg Ala Gly Pro Gly Leu Ser Pro Gly Thr  
 65 70 75 80  
 Leu Gly Pro Ser Met Ala Met Arg Val Ala Gly Gly Gln Asp Gly Ser  
 85 90 95  
 Cys Pro Pro Ala Ala Leu Gly Leu Leu Gly Ala Pro Met Thr Pro Gly  
 100 105 110  
 Gly Gly Pro Ala Ile Trp Val Arg Ser Ser Ile Pro Leu Arg Ala Ala  
 115 120 125  
 Ser Pro Thr Ser Trp Gly Thr Ser Arg Ser Ser Ala Pro Leu Gly Ala  
 130 135 140  
 Ser Pro Glu Leu Trp Arg Met Ala Ser Gly Ser Trp Arg Thr Gly Ile  
 145 150 155 160  
 Thr Gln Gln Gly Ile Phe Pro Val Ala Leu Phe Leu Ser Ser Phe Trp  
 165 170 175  
 Leu Phe Cys Pro Ala Leu Ser Gln Leu Arg Pro Ser Lys Cys Ala Thr  
 180 185 190  
 Leu Val Gly  
 195

<210> 10  
 <211> 196  
 <212> PRT  
 <213> Hepatitis C virus

<400> 10  
 Ala Arg Ile Leu Asn Leu Lys Glu Lys Pro Asn Val Thr Pro Thr Val  
 1 5 10 15  
 Ala His Arg Thr Ser Ser Ser Arg Val Ala Val Arg Ser Leu Val Glu  
 20 25 30  
 Phe Thr Cys Cys Arg Ala Gly Ala Leu Asp Trp Val Cys Ala Arg Arg  
 35 40 45  
 Gly Arg Leu Pro Ser Gly Arg Asn Leu Glu Val Asp Val Ser Leu Ser  
 50 55 60  
 Pro Arg His Val Gly Pro Arg Ala Gly Pro Gly Leu Ser Pro Gly Thr  
 65 70 75 80  
 Leu Gly Pro Ser Met Ala Met Arg Val Ala Gly Gly Arg Asp Gly Ser  
 85 90 95  
 Cys Leu Pro Val Ala Leu Gly Leu Ala Gly Ala Pro Gln Thr Pro Gly  
 100 105 110  
 Val Gly Arg Ala Ile Trp Val Arg Ser Ser Ile Pro Leu Arg Ala Ala  
 115 120 125  
 Ser Pro Thr Ser Trp Gly Thr Tyr Arg Ser Ser Ala Pro Leu Leu Glu  
 130 135 140  
 Ala Ala Pro Gly Pro Trp Arg Met Ala Ser Gly Phe Trp Lys Thr Ala  
 145 150 155 160

Thr Met Gln Gln Gly Thr Phe Leu Val Ala Leu Ser Leu Ser Ser Phe  
                                   165                                  170                                  175,  
 Trp Pro Cys Ser Leu Ala Leu Cys Pro Leu Gln Pro Thr Lys Cys Ala  
                                   180                                  185                                  190  
 Ile Pro Arg Gly  
                                   195

<210> 11  
 <211> 192  
 <212> PRT  
 <213> Hepatitis C virus

<400> 11  
 Ala His Phe Leu Asn Leu Lys Glu Lys Pro Lys Glu Thr Pro Ser Val  
   1                                  5                                  10                                  15  
 Ala His Arg Thr Ser Ser Ser Arg Val Ala Asp Arg Ser Leu Val Glu  
                                   20                                  25                                  30  
 Tyr Thr Cys Cys Arg Ala Gly Ala His Asp Trp Val Cys Ala Arg Arg  
                                   35                                  40                                  45  
 Val Lys Leu Leu Asn Gly His Ser Leu Ala Asp Asp Asp Ser Leu Ser  
                                   50                                  55                                  60  
 Pro Arg Arg Val Gly Ala Lys Ala Gly Pro Gly Leu Ser Pro Gly Thr  
   65                                  70                                  75                                  80  
 Leu Gly Pro Ser Met Val Thr Arg Ala Ala Gly Gln Gly Gly Gly Ser  
                                   85                                  90                                  95  
 Cys Pro His Ala Ala Pro Val His Pro Gly Ala Gln Met Thr Pro Gly  
                                   100                                  105                                  110  
 Gly Gly Pro Ala Ile Trp Val Lys Ser Ser Ile Pro Arg Ala Asp Ser  
                                   115                                  120                                  125  
 Pro Thr Ser Trp Gly Thr Ser Arg Gly Gly Ala Leu Leu Glu Ala Ser  
                                   130                                  135                                  140  
 Gln Glu Pro Ser Arg Met Ala Gly Pro Leu Lys Thr Gly Ile Ser Gln  
   145                                  150                                  155                                  160  
 Gln Gly Thr Cys Pro Val Ala Pro Phe Leu Ser Ser Phe Leu Leu Cys  
                                   165                                  170                                  175  
 Ser Leu Ala Phe Ile Gln Gln Pro Val Ser Gly Gly Ile Arg Leu Ala  
                                   180                                  185                                  190

<210> 12  
 <211> 197  
 <212> PRT  
 <213> Hepatitis C virus

<400> 12  
 Ala Gln Ile Leu Asn Leu Lys Glu Lys Pro Lys Glu Thr Gln Thr Ala  
   1                                  5                                  10                                  15  
 Ala His Arg Thr Leu Ser Ser Arg Val Ala Val Arg Ser Leu Ala Glu  
                                   20                                  25                                  30  
 Phe Thr Cys Cys Arg Ala Gly Ala Pro Gly Trp Val Cys Ala Arg Gln  
                                   35                                  40                                  45  
 Gly Arg Leu Leu Ser Asp Pro Ser Arg Val Asp Asp Ala Ser Pro Ser  
                                   50                                  55                                  60  
 Arg Lys Ile Gly Ala Pro Pro Ala Ser Pro Gly Glu Ser Gln Asp Ile  
   65                                  70                                  75                                  80  
 Leu Gly Pro Cys Thr Glu Thr Arg Val Ala Ala Gly Arg Val Gly Ser  
                                   85                                  90                                  95  
 Cys Pro Pro Ala Gly Leu Val Leu Leu Gly Ala Pro Pro Thr Pro Gly  
                                   100                                  105                                  110  
 Ile Asp His Ala Ile Trp Ala Glu Ser Ser Ile Pro Leu Arg Val Val

115	120	125
Leu Pro Thr Ser Trp Gly Thr Ser Leu Ser Leu Ala Pro Arg Leu Glu		
130	135	140
Ala Ser Pro Glu Leu Trp His Thr Val Leu Gly Ser Trp Arg Thr Gly		
145	150	155
Ile Thr Gln Gln Gly Ile Tyr Pro Val Ala Leu Phe Leu Ser Phe Cys		
165	170	175
Leu Leu Phe Cys His Ala Ser Gln Cys Gln Cys Leu Gln Trp Lys Ser		
180	185	190
Gly Thr Leu Val Leu		
195		

<210> 13  
 <211> 195  
 <212> PRT  
 <213> Hepatitis C virus

<400> 13
Ala Arg Ile Leu Asn Leu Lys Glu Lys Pro Asn Val Thr Pro Thr Ala
1 5 10 15
Ala His Arg Thr Leu Ser Ser Arg Val Ala Ala Arg Ser Leu Ala Glu
20 25 30
Phe Thr Cys Cys Arg Ala Gly Ala Pro Glu Trp Val Cys Ala Arg Arg
35 40 45
Gly Arg Leu Pro Ser Gly Arg Asn Leu Ala Gly Gly Val Ser Leu Phe
50 55 60
Pro Arg Pro Ala Asp Pro Arg Glu Gly Pro Gly Arg Ser Pro Gly Thr
65 70 75 80
Leu Gly Pro Ser Met Ala Thr Arg Ala Val Gly Gly Arg Asp Pro Ser
85 90 95
Cys Pro Pro Ala Ala Leu Gly Leu Val Gly Ala Leu Leu Thr Pro Gly
100 105 110
Gly Gly His Ala Ile Trp Val Arg Ser Ser Ile Pro Ser Arg Val Ala
115 120 125
Ser Pro Thr Ser Trp Gly Thr Ser Thr Ser Ser Ala Leu Leu Gly Ala
130 135 140
Leu Pro Glu Leu Trp His Met Val Leu Glu Ser Trp Lys Thr Ala Ile
145 150 155 160
Thr Gln Gln Gly Thr Ser Pro Val Ala Leu Phe Leu Ser Ser Cys Ser
165 170 175
Leu Phe Tyr Pro Ala Gln Ser Leu Leu Arg Pro Ser Glu Cys Ala Thr
180 185 190
Leu Arg Gly
195

<210> 14  
 <211> 194  
 <212> PRT  
 <213> Hepatitis C virus

<400> 14
Ala Gln Ile Leu Asn Leu Lys Glu Lys Pro Lys Glu Thr Pro Thr Val
1 5 10 15
Ala His Lys Thr Leu Ser Phe Arg Ala Ala Ala Arg Ser Leu Ala Glu
20 25 30
Tyr Thr Cys Cys Arg Ala Gly Ala Pro Gly Trp Val Cys Ala Arg Gln
35 40 45
Gly Arg Leu Arg Ser Gly Pro Ser His Val Glu Gly Ala Ser Pro Ser
50 55 60

Leu Arg Ile Gly Ala Pro Leu Ala Asn Pro Gly Glu Asn Gln Asp Thr  
 65 70 75 80  
 Pro Gly Pro Tyr Thr Gly Met Arg Asp Ser Ala Gly Gln Asp Arg Ser  
 85 90 95  
 Cys Pro Pro Glu Val Pro Val Pro Leu Gly Ala Pro Met Thr Pro Gly  
 100 105 110  
 Ile Gly Pro Ala Thr Trp Val Arg Ser Ser Ile Pro Arg Ala Ala Leu  
 115 120 125  
 Pro Thr Ser Trp Gly Thr Ser Leu Ser Ala Pro Arg Ser Ala Ala Ser  
 130 135 140  
 Pro Glu Leu Ser Arg Met Ala Glu Ser Trp Arg Thr Gly Leu Ile Leu  
 145 150 155 160  
 Gln Gln Gly Thr Tyr Pro Val Ala Pro Phe Leu Ser Ser Cys Trp Pro  
 165 170 175  
 Cys Cys Pro Ala Ser Pro Pro Arg Ser Pro Leu Pro Lys Arg Thr Ser  
 180 185 190  
 Val Pro

<210> 15  
 <211> 194  
 <212> PRT  
 <213> Hepatitis C virus

<400> 15  
 Ala Gln Ile Gln Asn Pro Lys Asp Lys Pro Lys Glu Thr Pro Thr Val  
 1 5 10 15  
 Ala His Arg Thr Ser Ser Ser Arg Ala Val Val Arg Ser Trp Val Glu  
 20 25 30  
 Tyr Thr Cys Cys Arg Ala Gly Ala Leu Asp Trp Val Cys Ala Arg Leu  
 35 40 45  
 Gly Arg Leu Pro Asn Gly Pro Ser Pro Glu Ala Gly Val Ser Pro Phe  
 50 55 60  
 Gln Arg Leu Ala Ala Arg Arg Ala Val Pro Gly Val Ser Leu Gly Thr  
 65 70 75 80  
 His Gly Pro Cys Met Gly Met Arg Ala Ala Gly Gly Gln Gly Gly Ser  
 85 90 95  
 Cys Pro Pro Ala Ala Leu Ala Gln Arg Gly Ala Gln Thr Thr Pro Gly  
 100 105 110  
 Val Gly Leu Ala Thr Trp Val Arg Ser Ser Ile Pro Leu Leu Ala Ala  
 115 120 125  
 Ser Pro Thr Trp Gly Thr Ser Pro Ser Ala Ala Pro Gly Ala Ser Gln  
 130 135 140  
 Gln Gln Leu Trp Arg Met Ala Ser Gly Leu Leu Arg Thr Gly Ile Met  
 145 150 155 160  
 Gln Gln Gly Ile Phe Pro Val Ala Pro Phe Leu Ser Ser Phe Trp His  
 165 170 175  
 Phe Phe Arg Ala Leu Tyr Gln Pro Arg Gln Ser Ile Met Pro Ile Arg  
 180 185 190  
 Ala Ala

<210> 16  
 <211> 195  
 <212> PRT  
 <213> Hepatitis C virus

<400> 16  
 Ala Arg Ile Leu Asn Leu Lys Glu Lys Pro Asn Val Thr Pro Thr Ala

1	5	10	15
Ala Gln Trp Thr	Leu Ser Ser Arg	Val Val Ala Arg	Ser Leu Ala Glu
20	25	30	
Phe Thr Cys Cys	Arg Ala Gly Ala	Pro Asp Trp Val	Cys Ala Arg Leu
35	40	45	
Gly Arg Leu Arg	Ser Gly Arg Asn	Leu Val Glu Asp	Ala Asn Leu Ser
50	55	60	
Pro Arg Arg Val	Asp Pro Arg Glu	Gly Pro Gly His	Asn Gln Asp Ile
65	70	75	80
His Gly Leu Phe	Thr Val Met Arg	Val Val Gly Gly	Gln Asp Gly Ser
85	90	95	
Cys Pro Pro Val	Ala Leu Asp Arg	Leu Gly Ala Gln	Met Ile Pro Ala
100	105	110	
Gly Gly Pro Ala	Ile Trp Val Arg	Ser Ser Ile Pro	Pro Ala Ala Ser
115	120	125	
Pro Thr Ser Trp	Asp Thr Ser Arg	Ser Ala Pro Pro	Trp Val Ala Ser
130	135	140	
Pro Gly Pro Trp	His Met Val Ser	Gly Leu Trp Arg	Thr Gly Ser Ile
145	150	155	160
Met Gln Gln Gly	Ile Ser Pro Val	Ala Pro Phe Leu	Ser Ser Ser Trp
165	170	175	
His Phe Phe Arg	Ala Leu Ser Pro	Leu Arg Pro Leu	Thr Ile Ala Met
180	185	190	
Ser Gln Ala			
195			

&lt;210&gt; 17

&lt;211&gt; 192

&lt;212&gt; PRT

&lt;213&gt; Hepatitis C virus

&lt;400&gt; 17

1	5	10	15
Ala Gln Ile Leu	Asn Leu Lys Glu	Lys Pro Asn Val	Thr Pro Thr Ala
20	25	30	
Ala His Arg Thr	Ser Ser Ser Arg	Ala Val Val Arg	Ser Leu Val Glu
35	40	45	
Phe Thr Cys Cys	Arg Ala Gly Ala	Pro Gly Trp Val	Cys Ala Arg Leu
50	55	60	
Gly Arg Leu Pro	Ser Gly Arg Asn	Leu Val Glu Gly	Asp Asn Leu Ser
65	70	75	80
Pro Arg Phe Ala	Gly Pro Arg Ala	Gly Pro Gly Leu	Ser Pro Gly Thr
85	90	95	
Leu Gly Pro Ser	Met Ala Met Arg	Val Trp Gly Gly	Gln Asp Gly Ser
100	105	110	
Cys His Pro Gly	Ala Leu Gly Leu	Val Gly Ala Pro	Arg Thr Pro Gly
115	120	125	
Val Gly Arg Val	Ile Trp Val Arg	Ser Ser Ile Pro	Leu His Ala Gly
130	135	140	
Ser Pro Thr Ser	Trp Gly Thr Phe	Pro Ser Ala Ala	Pro Gly Ala Leu
145	150	155	160
Pro Gly Pro Trp	Arg Met Val Ser	Gly Phe Trp Arg	Ser Ala Thr Thr
165	170	175	
Gln Gln Gly Phe	Pro Val Ala Leu	Ser Leu Ser Ser	Pro Cys Cys
180	185	190	
Pro Val Pro Phe	Gln Leu Pro Leu	Met Lys Cys Ala	Thr Cys Pro Gly